Remarks/Arguments:

Claims 78, 81, 87, 89-90, 93, 97 and 99-100 are pending in the above referenced application. Applicants respectfully traverse the Examiner's rejections of these claims. No new matter is introduced herein.

Claims 78, 87, 89, 93, 97 and 99-100 stand rejected under 35 U.S.C. § 103(a) as obvious over Asami et al. (U.S. Patent No. 5,415,978) and Byer et al. (U.S. Patent No. 5,036,220). Claims 81 and 90 stand rejected under 35 U.S.C. 103(a) as obvious over Asami, Byer and Nitta (U.S. Patent No. 5,590,145). It is respectfully submitted, however, that the claims are patentable over the art of record for the reasons set forth below.

Applicants' invention, as recited by claim 78, includes a feature which is neither disclosed nor suggested by the art of record, namely:

> ...a single mode fiber for conveying laser light from the semiconductor laser to the optical wavelength conversion element...
>
> ...wherein the single mode fiber is configured to prevent a variation in temperature of the optical wavelength conversion element caused by a heat generated from the semiconductor laser, the semiconductor laser being remote from the optical wavelength conversion element.

The Examiner admits that neither Asami nor Byer, alone, discloses all features of claim 78. Further Asami and Byer are not properly combinable to form "a single mode fiber . . . configured to prevent a variation in temperature of the optical wavelength conversion element caused by a heat generated from the semiconductor laser, the semiconductor laser being remote from the optical wavelength conversion element."

Asami relates to a method for forming a reproduction image in a chemically and physically photosensitive material having spectral sensitivity in the visible region. See col. 1, lines 7-11. An image is formed by scanning the photosensitive material with a laser beam emitted from a laser device. Asami states that the problem to be solved by the disclosed method is that carrying out scanning exposure of the

photosensitive material with a beam causes variability in density of a formed image. See col. 2, line 55 through col. 3, line 24.

Specific embodiments of an apparatus for carrying out the method include a semiconductor laser and a wavelength conversion element, "at least one of which is equipped with a temperature control means." Col. 5, lines 25-28. The temperature control means (namely a Peltier element and a heat sink) maintain either the semiconductor laser or the wavelength conversion element or both "at a predetermined temperature," to ensure "precise operation of both the semiconductor laser 102 and the resonator without a temperature drift." See col. 17, lines 21-41. "The precision of temperature control of the light sources (including semiconductor lasers, resonators and the like) by the temperature control means should preferably be within ±1° C. centering at the set operating temperature. The precision of temperature control within this range enables to provide a stable laser output, ensuring that images of a higher quality free of variable density are formed." See col. 20, line 64 through col. 21, line 4.

By providing the temperature control means, such as heat sink 112 and Peltier element 114 to the semiconductor laser 102, any rise in temperature of the semiconductor laser 102 can be suppressed, thus stabilizing the output of the semiconductor laser 102. Use of the temperature control means on either or both of the semiconductor laser and the wavelength conversion element allows for carrying out a method of forming a reproduction image in a chemically and physically photosensitive material having spectral sensitivity in the visible region by scanning it with a laser beam, while preventing the variability in density of a formed image. In other words, use of a special heat release structure is essential to Asami's method. Consequently, one of ordinary skill in the art would not consider remotely disposing the semiconductor laser 102 from the optical wavelength conversion element 110 sufficiently so as to prevent heat generated by the semiconductor laser from affecting the wavelength conversion element, as required by claims 78 and 87.

Byer relevantly discloses a nonlinear optical generator. As shown in FIG. 1, the generator relevantly includes a diode laser 12 connected to a waveguide means 13 by a fiber 17.

A combination of Asami and Byer would change the principle of operation of the primary reference and render the reference inoperable for its intended purpose. See MPEP § 2145(III). That is, if a fiber were used to remotely dispose Asami's laser from its resonator to prevent a variation in temperature of the resonator, the resulting structure would not provide the precision temperature control required by Asami to ensure high quality images.

Second, Asami teaches away from combining Asami and Byer. See MPEP § 2145(X)(D)(2). Asami teaches use of a Peltier element and a heat sink on one or both of the laser and the wavelength conversion element to precisely control the temperature of one or both of the laser and the wavelength conversion element. Because Asami teaches precision temperature control for providing high quality images, Asami teaches away from using a fiber to remotely dispose the laser from the wavelength conversion element as a form of temperature control because such a structure would not provide the precision temperature control Asami requires.

The Examiner argues that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Asami et al. what is taught by Byer to efficiently couple the laser light into the wavelength conversion element." The Examiner's asserted motivation for combining Asami and Byer, however, does not suggest "the single mode fiber is configured to prevent a variation in temperature of the optical wavelength conversion element caused by a heat generated from the semiconductor laser, the semiconductor laser being remote from the optical wavelength conversion element." Instead, one of ordinary skill in the art may only be motivated to dispose a length of fiber between a laser and a wavelength conversion element that is sufficient to efficiently couple the laser light into the wavelength conversion element. This may result in a combination wherein the single mode fiber is NOT configured to prevent a variation in temperature of the optical wavelength conversion element caused by a heat generated from the semiconductor laser, despite the semiconductor laser being remote from the optical wavelength conversion element.

It is because Applicants include the feature of a single mode fiber for conveying laser light from the semiconductor laser to the optical wavelength conversion element, wherein the single mode fiber is configured to prevent a variation in temperature of

the optical wavelength conversion element caused by a heat generated from the semiconductor laser, the semiconductor laser being remote from the optical wavelength conversion element, that the following advantages are achieved. Namely, the laser may be sufficiently remotely disposed from the optical wavelength conversion element that heat generated by the laser does not affect the temperature of the optical wavelength conversion element. Using this configuration, no added cooling element is necessary.

Accordingly, for the reasons set forth above, claim 78 is patentable over the art of record.

Claim 87, while not identical to claim 78, includes features similar to claim 78. Accordingly, claim 87 is also patentable over the art for the reasons set forth above.

Claim 81 includes all the features of claim 78 from which it depends and claims 89, 90, 92, 93 and 97 include all the features of claim 87 from which they depend. Thus, claims 89, 90, 92, 93 and 97 are also patentable over the art of record for the reasons set forth above.

Further, with respect to claims 99 and 100, The Examiner argues that FIGS. 1 and 2 of Asami disclose that "the semiconductor laser is fixed in a housing without active cooling." Applicants disagree. FIG. 1 does not show specific laser light sources 54R, 54G and 54B (the elements that utilize the heat sink and Peltier element). FIG. 2 is directed to exposure section 50 and shows laser light sources 54R, 54B and 54G in block diagram form. FIG. 3 shows the laser light source 54G provided in the exposure section 50 of FIG. 2. It is clear from the disclosures at FIG. 3 and col. 17, lines 21-24 that the semiconductor laser 102 is maintained at a predetermined temperature by the heat sink 112 and the Peltier element 114. Thus, FIG. 2 incorporates the laser light source 54 G shown in FIG. 3, including the heat sink and Peltier element.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance which action is respectfully requested.

Respectfully submitted,

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